



# United States Department of Agriculture,

## DIVISION OF AGROSTOLOGY.

[Grass and Forage Plant Investigations.]

### THE RENEWING OF WORN OUT NATIVE PRAIRIE PASTURES.

Throughout the prairie regions of the West one frequently sees native pastures nearly devoid of grass and often grown up to weeds of various kinds. Plainly such pastures are of little value to the owners, so far as the forage obtained from them is concerned, and the weeds are a constant eyesore, often rendering the land even worse than worthless.

Such a condition of things is usually due to two causes, drought and overstocking. While the farmer may have no control over the drought itself, he can, by a little care and foresight, put the pasture in condition to withstand it in a great measure, and he certainly can prevent the pasture from being overstocked. Not infrequently the use of the pasture is almost entirely lost for one or two seasons, when a little rest by removing the stock for a time or by feeding green corn, sorghum, or other soiling crops would have kept it in good condition.

The native grasses are hardy and are adapted to the natural conditions which prevail on the prairies. Some species stand grazing much better than others, and after a pasture has been used for several years it will be found that the weaker grasses are giving way to the stronger ones.

As a rule the forage obtained from the average prairie pasture is furnished by a comparatively small number of species. In the more thickly settled portions of the great prairie States big blue-stem, bushy blue-stem, western wheat-grass, switch grass, prairie June-grass, wild rye, blue joint, and the various species of *Stipa* and *Bouteloua* furnish most of native pasturage.



WEEDS OF THE NATIVE PASTURES.

FIG. 1.—Western wheat-grass (*Agropyron spicatum*).

The most troublesome weeds are either annuals or perennials. The former, because of their vigorous and rapid growth, spring up and take possession of a pasture in a very short time. The latter spread more slowly, but are more difficult to eradicate. Left to themselves, the native grasses will hold their own against the weeds, but when they are pastured off and trampled upon by the stock they are less able to cope with the more aggressive species, and soon begin to die out. This is the time when the farmer should give the grasses some extra care. With very little trouble the pasture can be kept in condition for profitable grazing, while neglect or carelessness may result in the practical loss of the use of the pasture for one or more seasons.

Perennial weeds, such as golden-rod, iron-weed, and some of the sunflowers, can usually be kept in check by mowing when in early bloom. The mower should be run high so as to miss as much of the grass as possible. Occasionally it is necessary to grub out such plants as the rosinweeds.

Annual weeds, like maretail or fireweed, sunflower, and ragweed, may be destroyed in the same manner. The mowing should always be done before the seeds ripen. This not only gets rid of the weeds, but gives the grass a chance to take advantage of the fall rains. A thorough harrowing in the spring while the weeds are very young will destroy many of them and will also give new life to the grass. Very often weeds of both classes may be very effectually checked by burning over the pasture after they are well started in the spring.

#### EFFECT OF CULTIVATION ON NATIVE GRASSES.

The various native grasses are very differently affected by cultivation. Some do not do well at all and soon die out, others are but little affected either way, while still others respond very quickly and improve almost at once. This last class includes the most valuable of the native species, such as big blue-stem, western wheat-grass, wild-rye, and prairie June-grass.

The effect of loosening up the soil is very apparent in a field which has "gone back" and seeded itself to wheat-grass or blue-stem. In many parts of Nebraska and the Dakotas three tons or more of hay is often cut from such fields. The fine growth which most grasses make along the edges of cultivated fields is a sight familiar to all who have traveled over the western prairies, and ought to be an object lesson to those to whom these same grasses are of so much importance.

The fact that cultivation improves the more desirable native grasses has been demonstrated by nearly every experiment station in the West and by a great many private parties as well.

An experiment made at the Kansas Station in 1892 shows what a thorough stirring up of the soil will do for an upland prairie pasture. The experiment was made on a pasture in which the grasses had been dying out for some time and the weeds were beginning to appear in abundance. It had been reduced to this condition by drought and overpasturing. The surface was thoroughly loosened up by driving a weighted disc harrow over the field in several directions. The pasture was sown to a mixture of orchard grass, meadow fescue, blue grass, timothy, red top, clover, and alfalfa, which was harrowed in and a roller was driven over the field to level the surface and firm the ground. The seed germinated quickly and the tame grasses made an excellent start, but by September the wild grasses had crowded them out and held complete possession of the field.

In this case the stirring of the soil and the season's rest not only enabled the prairie grasses to recover and to overcome the weeds, but to crowd out a good stand of tame grasses as well.

This has been the experience in Nebraska and South Dakota where like attempts have been made to renew worn out pastures. The tame grasses are undoubtedly valuable aids, since the hardier of them will retain at least partial possession of portions of the pasture and add considerably to the forage obtained. Many of them, though they do not as a rule stand drought so well as the native species, start earlier in the spring or make a better growth in the fall, and thus lengthen the season during which the pasture may be used.

The continual trampling of the stock can not help but pack the soil more or less, and consequently prevent its proper aeration. This packed condition also keeps the water from gaining ready entrance, and it runs off and is lost. This,



FIG. 2.—Slender wheat-grass (*Agropyron tenerum*).

too, when lack of moisture is perhaps the principal reason for the failure of the pasturage. The old grass roots become crowded and die out or are weakened through lack of available food and suitable soil in which to develop.

It is very readily seen then why the treatment which was given to the pasture at the Kansas Station produced such excellent results. The tearing up of the soil gave ready access to air and moisture, putting new life into the roots of the grasses which were cut up and separated by the disc harrow, so that thousands of new shoots sprang up immediately. The rest for one season gave these new plants time to get well established and form a new sod.

If this treatment is given before the pasture is too badly damaged, there is usually no need of sowing so much tame grass seed. There is little doubt that an occasional tearing up of this kind and a little care given to the time and manner of pasturing will get as much pasturage from the native grasses as can be obtained from tame varieties under the same conditions.

#### MANURING NATIVE PASTURES.

There is quite a diversity of opinion among farmers and stock raisers on the question of manuring native pasture lands. Some have obtained excellent results by manuring, while others seem to have had quite the opposite experience.

The soil of the western prairies is very rich and under ordinary circumstances will give fair returns without the application of fertilizers of any kind. Nevertheless, it is certain that better returns may be had if more *available* food is placed within reach of the grasses. Any one who has observed a piece of grass land so situated as to receive the wash from a barnyard, will have found that near the yard where the supply of fertilizer has been great the grasses have become thinned out to a few species, while where the supply has been moderate the grasses are much more evenly developed and the yield decidedly better than upon the unfertilized prairie. The lesson is plain. A too plenteous application of fertilizer will thin out the grasses and reduce the yield of forage at least for the first season or two, since many species will not stand such treatment. On the other hand, a proper amount of fertilizer will increase the yield. It is quite possible to use too much fertilizer for any crop, and the native grasses seem to be more sensitive in this respect than the ordinary cultivated species.

Any pasture which has been grazed closely for some time will be benefited by an application of a thin top-dressing of well rotted stable manure, followed by a thorough harrowing. It is doubtful if much is gained by putting coarse unrotted manure on the pasture; it can be used to better advantage on cultivated land. Ashes usually have a beneficial effect upon grasses on soils not too plentifully supplied with alkali.

#### SOWING TAME GRASSES ON NATIVE PASTURE LANDS.

While it is hardly possible, and not always desirable, to make a native pasture over into a tame one, yet, as stated before, the pasturage may be materially increased by the addition of some of the cultivated species. A pasture which has had the thin places seeded to hardy tame grasses is certainly more valuable than it would be were these same places grown up to weeds.

In dry upland pastures such grasses as Kentucky blue-grass, sheep's fescue, red fescue, and Canadian blue-grass may be used to advantage. The fescues are especially valuable if the soil is very sandy.

Lowland pastures, particularly those in which the grass has been killed out by overfallowing, may be reseeded with timothy, fowl meadow grass, red top, meadow fescue, and alsike. Kentucky blue-grass will do well if the soil is not too wet. It is likely that smooth brome-grass will prove useful on pastures that are to be kept for long periods of time.

The practice of collecting the seeds of such native species as western wheat grass, slender wheat-grass, wild rye, prairie June-grass, and the blue-stems and



FIG. 3.—Big blue-stem  
(*Andropogon provincialis*).

sowing them on the pasture is to be recommended. The writer recalls an instance where a farmer in South Dakota obtained an excellent pasture by collecting western wheat-grass and filling in the bare places with it.



FIG. 4 — Bushy blue-stem  
(*Andropogon nutans*).

Though timothy as a general thing is a poor pasture grass for upland soils, it may sometimes be profitably employed in old or worn pastures. The farmer very often has a greater or less quantity of seed which has shattered out in the hay mow. It has cost practically nothing and would probably hardly pay for the cleaning if he were to sell it. If this be scattered about over the pasture, either in the fall or spring, it will pay very well indeed. The timothy may not live in the pasture more than two or three years, but it will yield considerable forage in the mean time and help the native grasses keep down the weeds. In eastern Nebraska, Kentucky blue-grass is one of the best grasses that can be used for reseeding the native pastures. The seed may be sown just as the last snow is melting in the early spring. The grass when once started keeps slowly spreading, and after a time forms an excellent sod. It begins its growth early in the spring and, though often dry and short during midsummer, makes good grazing after the fall rains, and hence gives a longer season, during which the stock can be kept on the pasture.

#### SUMMARY.

1. Keep from overstocking.
2. When the soil begins to get baked and packed, stir it up with a harrow.
3. Give occasional light top-dressings of well rotted stable manure.
4. Fill in thin spots with hardy tame or wild grasses before the weeds get a start.
5. Keep the weeds mowed off so that the grasses may get the benefit of *all* the plant food there is in the soil.

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